

Fundamental Constants for Electromagnetism, Gravity, and Quantum Physics

Compiled by Harmonic Minor Research

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1 Fundamental Constants

This document provides the essential physical constants used in harmonic quantum gravity and fundamental interactions.

1.1 Speed of Light in Vacuum

$$c = 299,792,458 \text{ m/s} \quad (\text{exact}) \quad (1)$$

1.2 Planck's Constant

$$h = 6.62607015 \times 10^{-34} \text{ J}\cdot\text{s} \quad (2)$$

1.3 Reduced Planck's Constant

$$\hbar = \frac{h}{2\pi} = 1.054571817 \times 10^{-34} \text{ J}\cdot\text{s} \quad (3)$$

1.4 Elementary Charge

$$e = 1.602176634 \times 10^{-19} \text{ C} \quad (4)$$

1.5 Fine-Structure Constant

$$\alpha = \frac{e^2}{4\pi\epsilon_0\hbar c} = \frac{1}{137.035999206} \quad (5)$$

1.6 Vacuum Permittivity (Electric Constant)

$$\epsilon_0 = 8.854187817 \times 10^{-12} \text{ F/m} \quad (6)$$

1.7 Vacuum Permeability (Magnetic Constant)

$$\mu_0 = 4\pi \times 10^{-7} \text{ N/A}^2 \quad (7)$$

1.8 Gravitational Constant

$$G = 6.67430(15) \times 10^{-11} \text{ m}^3\text{kg}^{-1}\text{s}^{-2} \quad (8)$$

1.9 Cosmological Constant

$$\Lambda \approx 10^{-52} \text{ m}^{-2} \quad (9)$$

2 References

References

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